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JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, ANNELIDES,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

No. CCVII.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price ONE SHILLING.

Mr. Westwood exhibited, and read the description of, a new and beautiful species of Phasmidæ, for which he proposed the name of Donelytron Batesianum, and to publish a coloured figure in the 'Transactions' of the Society, it having been forwarded by Mr. Bates, from the Amazon River, too late for representation in Mr. Westwood's monograph on the family, published by the Trustees of the British Museum.

Mr. Westwood also exhibited a fine Papilio, collected in New Caledonia, by Mr. MacGillivray, of which the following are the characters :—

PAPILIO (ULYSSES, *var.*) ULYSSINUS, *Westw.*

Alis nigris dimidio basali cæruleis, corpore et basi alarum viridi irroratis, venulis tribus venæ medianæ macula holosericea nigra singulatim indutis, incisuris marginalibus albido maculatis; alis subtus fuscis, luteo-variis striga transversa areæ discordalis, lutea; posticis lunulis 6-maculaque anali luteis, squamis cæruleis supra marginatis. Expans. alar. unc. 3⅔.

Mr. Westwood, in describing this insect, called attention to the state of the question as to the views of the modification of species entertained by different recent writers, and observed that it appeared to him to afford an additional proof of the fact that, whilst many species of insects seemed to be free, under any changes of time or place, from more than occasional and slight *individual* variation, other insects evidently exhibited decided modifications of higher than individual character, wherever they existed in distinct localities. Of the former of these kinds of species he quoted Cynthia Cardui, which maintained its pure specific character almost all over the world (to which Mr. Douglas added Deiopeia pulchella); whilst of the other kind Papilio Paris, and apparently P. Priamus (to which P. Ulysses might now be added), might be cited. Hence Mr. Westwood considered that the fine Papilio exhibited that evening was another local variety of P. Ulysses; and he suggested for it the subspecific name of "Ulyssodes." He added that in the British Museum collection is another geographical sub-species, also from New Caledonia, in which the male has scarcely any trace of the silky patches on the fore-wings, although agreeing in size with Ulyssinus. For this he proposed the name of P. (Ulysses) Ulyssellus. This diversity in the modificational powers of certain species had, he believed, not been sufficiently noticed in treating upon the question of the modification of species. He considered it would be advisable, however, to give to each decided geographical modification of a species a separate specific or sub-specific name.

Mr. Waterhouse admitted the existence of decided and well-marked geographical races amongst certain insects, citing certain species of Philippine Pachyrhynchus. He had not, however, deemed it necessary to give to these races distinct names. He also noticed the fact that whilst certain species seemed never to vary (Coccinella 7-punctata for example), other species in the same genus were so variable, in the same locality, that it was scarcely possible to obtain two specimens alike.

Mr. Westwood also observed that he was not sure whether the grand new Ornithoptera, for which Mr. Wallace proposed the name of "Crœsus," might not be a local variety of O. Priamus.

Mr. Pascoe stated, with reference to his papers on the Longicorn Coleoptera, published in the 'Transactions' of the Society, that he had ascertained his genus Blemmya was identical with Euryarthrium, *Blanch.*, and that Anomæsia was referrible to Eunidia, *Erich.*, which is also the Erethis of Dejean. His names therefore,

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being the most recent, must be suppressed. He also mentioned that Sophronica, *Dej.*, was synonymous with Dasyo, and that his Pachypeza implex appeared to be the Cacostola leucophæa of the same author.

Mr. Smith read some notes on the economy of the Ichneumons constituting the genus Pezomachus of Gravenhorst, with observations on Pezomachus fasciatus.

Mr. Waterhouse read two papers, intituled "Notes on the British Species of Donacia," and "Notes on the British Species of Cissidæ."

Part 2 of the current volume of the Society's 'Transactions' was on the table. —*E. S.*

Notes on the Mountain Birds of Jamaica.

By W. Osburn, Esq.*

"Freeman's Hall, Jamaica,
"June 7, 1859.

"My dear Sir,—It may be as well to preface my remarks on the mountain birds of Jamaica by defining briefly what I understand by mountains. The centre of this portion of the island is occupied by what may be termed the central ridge; but in truth it is a series of ridges, succeeding each other so constantly that in crossing it is difficult to say when the highest point is reached. However, regarding them as a whole, the summit of the chain may generally be recognised, as far as my observations go, by the greater tendency of the limestone to spread into clay-covered flats, often interrupted by gullies, but which still render the forest which shrouds them much more accessible than it is among the ridges and 'cock-pits' which furrow in every direction both the northern and southern slopes. The red conglomerate here constantly appears from beneath the limestone, as is the case in the little valley which includes the pastures round this house. I have, unfortunately, no means of ascertaining the exact height of any point in this immediate neighbourhood; but we may, I think, attain to an approximation. On my last journey across the island I ascended the Bull's Head, a lofty point of the red conglomerate, near the boundaries of Clarendon and St. Ann's. The view from the summit was magnificent over the sugar-estates and hills of Clarendon and Vere, and far out to sea beyond Old Harbour, and eastward over St. John's to the Blue Mountains, and westward along the flanks of the many ridges of Manchester and St. Elizabeth's. But the lofty, unbroken ridges of Trelawny and St. Ann's prevented any very extensive prospect northward, so that it was quite impossible from this point to catch a glimpse of the sea on either shore as from the Dolphin's Head in Westmoreland. Indeed, the Bull's Head is very improperly represented in the map as an isolated peak; for from its summit it is very difficult to say whether many other points in the same ridge are not even a little higher. Now, its altitude in Wyld's map (1851) is given at 3140 feet. Assuming this to be correct, the height of these middle ranges hereabouts may be estimated at about 3000 feet. They are characterized by forest scenery peculiarly their own. The forest is largely composed of Santa Marias (*Calophyllum*), whose gigantic size make the long thatch-palms beneath them seem pure underwood. Besides these and the arborescent ferns there is little undergrowth to mask the interminable colonnades of gray trunks. The hog-hunters' paths wind among them for miles, and for immense districts are the only roads. This I would call the central range. In this district, which includes the Black Grounds, Freeman's Hall is situated. Between this and the northern coast the slope is interrupted by abrupt ridges, also of limestone, so broken and precipitous that large portions of their surface are inaccessible, and rendered still more so by the forest, which clothes all but the precipices, and whose dense underwood and general aspect is such as covers the mountains of St. Elizabeth's and Westmoreland, so well described in your works. Many plants, for instance a species of Begonia common in this district, do not penetrate into the mountains above, nor into the cultivated hills nearer the coast. These I would term the lower ranges. The cultivated hills still nearer the coast, though they attain to considerable height, as the magnificent views of the Carribbean Sea, which so constantly burst upon the traveller, prove, Trelawny being one of the oldest and most assiduously cultivated of the sugar parishes, the eminences have long been cleared, the soil in consequence washed off, and only the intervening valleys planted in canes.

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* Communicated by P. H. Gosse, Esq., F.R.S.

It is some points in the Ornithology of the two first districts I propose to consider. That the distinction I have drawn between them is, even for this purpose, important, there are abundant proofs. One of the most remarkable is, that while Aramus Scolopaceus abounds in the lower ranges so that I never cross the woods towards evening without hearing or seeing these birds, I have not met with a single instance of the species in the upper range; and the negro sportsmen confirm this observation. When I first proposed to visit the central range, the general remark from persons well acquainted with it was, "You will find very few birds there" during the months of January and February.

And so far as the forest was concerned (and here it comprises all but the small cleared patches), I found the observation much more accurate than I supposed. I often rode for miles, carefully on the look out, without seeing a single bird. Indeed, these vast wilds appeared like mid-ocean, destitute of life, save at the edges and along the banks of streams. It was not, however, silent, for it was rarely the long-drawn bell-like note of the solitaire (*Ptilogonys*) was not audible at a greater or less distance. I was already acquainted with it in the lower mountains round Mahogany Hall; but here it abounded, especially towards the edges of the forest. I soon procured specimens, and saw others sitting on branches, in the puffed, absorbed posture you describe. On my return, in April, they were completely gone; so that I have never heard the nuptial notes or seen the summer dress of this interesting bird. It seems that we are not sufficiently elevated here for their constant residence. Equalling the solitaire in its love of solitude is your little Sylvicola pharetra, but not in sedentary habit; for if at rare intervals I came across an unusual bustle and flutter among the twigs and leaves of the lower branches of some forest giant, it generally proved this little bird. I have never met with it but in the woods, and then quite alone. It was, however, at that time far from abundant; for, though constantly on the look-out, I only got a single specimen in January, and another in the first two weeks in February. But on my return, in April, a marked change had taken place: the forest was no longer silent, but resounded with the differing notes of myriads of birds, of many different species; and in none was the accession in numbers more marked than in this Sylvicola. Their cheerful, busy flutter occurred over head at every few yards in some districts. I easily procured several more specimens. My impression is, so far as observations made in the two last weeks of April go, that it migrates here in the spring, and that those met with during the winter are only stragglers left behind. Since my return, a few days ago, the rains have been so constant and heavy that I have had no opportunity for ascertaining whether they are still here, though I have little doubt of it. Very similar in habit and habitat is the other species you discovered (S. pannosa). I procured one a year ago near Grand Vale, but never met with it again till I arrived here. I only procured a single specimen, hunting quite alone in the undisturbed recesses of the forest. It proved, as yours, also a female. The most careful search never procured me another, though I was anxious to ascertain the plumage of the other sex. However, in crossing the mountains between Clarendon and St.

Ann's, on Greenock estate, during the middle of April, I met with them in considerable abundance. Though they gave me the opportunity of a pretty close examination, I was unfortunately unable at the time to shoot one. The colours then seemed brighter, and the yellow on the breast especially more decided. I expected to meet with them at Freeman's Hall (here), only ten or twelve miles westward on the same ridge; but, to my disappointment and surprise, I could not fall in with them. I have in my own mind no doubt as to the reality of this distinct species.

"Towards the end of last year, whilst riding through the lower mountains, a perfectly black bird alighted on a wild pine growing at some height in a vertical position; and as I watched it I observed it climb about the stiff leaves with great agility, and eagerly search their sheathing bases. Your surmise as to the black banana bird instantly occurred to me. I did not then procure it, but the negroes assured me they were abundant higher up, and the investigation was one of the chief objects I proposed to myself on coming here. I did not find them very common, and procured only four specimens during the first six weeks of the year. They are to be met with especially in those deep damp hollows which the forest growth seems striving to conceal, and where orchideous parasites and wild pines luxuriate in abundance. It may there be seen climbing among them, as mentioned above, or flying from tree to tree in short flights; or, if not visible, its very peculiar call is audible far over head. I would imitate it by 'kep-chur-r-r-r,' the first a loud, clear note, followed by a rattle reproduced with sufficient exactness by a long, rough 'r.' The whole bird is coloured black, and that of the plumage has the purplish gloss of our Quiscalus. The hind toe seems rather more developed than with Icterus leucopteryx; and it has, I think, a corresponding increase of climbing power, oftener assuming the vertical attitude. One I shot hung head downwards for some time, exactly as the common banana bird will do. Another very marked distinction is, that the culmen, or upper ridge of the bill, is flattened and broad, dividing the frontal feathers like a plate, but does not expand. The following are the dimensions of two specimens; the second was a female, and the first, I believe, a male, though the part was much injured:—

Length 8¼. Exp. 13. Flex. 4½. Tail 2⅞. Rictus 1. Tarsus 1. Mid. toe ⅞.
" 7½. " 12. " 4. " 2⅞. " 1. " 1. " ⅞.

Hallux ⅝, not therefore so long as the tarsus. Intestine 8. The stomachs of all four contained fragments of insects, Coleoptera chiefly; I found no traces of seeds. On the 11th of February the ova of the female were still minute; and in skinning them I noticed a rank odour common to many Corvidæ. A female was brought to me still alive, and apparently uninjured except a fracture of the leg. It showed not the slightest pugnacity when handled, and lived several hours. It had not any notion of applying the uninjured foot to a flat surface, but kept it grasped. I put it on a perch: whether from pain or weakness I do not know, but it immediately slipped round, and hung suspended head downwards by its sound foot for some time, and then fell. I do not regard this as a satisfactory proof that the bird habitually rests in this position; but it is not impossible, because, according to the ordinary theory of perching, that in which the weight of the body is brought to bear is, with most birds, the easiest position; whereas this bird made no effort to keep upright, but immediately slid round, as if that were the most available posture for holding on. Of its nidification I have as yet learnt nothing. Should this species prove new to Science, as well as an addition to our Jamaica list, I would propose 'nigerrimus' as the specific name, if it is not already appropriated.

"I have discovered nothing with regard to the second, and I presume smaller, black species you allude to. Had you any particulars about it?

"A second bird, rather abundant in this district, and not included in your list, is a sober-suited olive-coloured little fellow, that keeps pretty much to the higher branches of lofty trees, though I have not unfrequently met with it on less elevated positions. From its strong, compressed, deeply toothed bill, I was at first inclined to suppose it might belong to Mr. Swainson's extensive genus Thamnophilus; but a better acquaintance with its habits and structure has convinced me that it should probably be classed among his Ampelidæ, and somewhere near Pteruthius perhaps, though I am unable to refer it satisfactorily to any of his genera. Not to fill up my letter with a detailed description, which I propose forwarding with the specimens, I may add that the head is a gray dubious olive, which becomes greener on the back. The quills and tail smoky black, with olive edges and the under parts dingy yellow. But its chief characteristics are the disproportionate size and thickness of the head, which seems only owing to the arrangement of the feathers, for it would not be suspected from the dried skin. I hope to forward an outline taken from a specimen when quite recent. The gray-blue of the beak is singularly in contrast with the prevailing tints of the plumage. The bird is tame and fearless, and, if perching low, may be easily approached; and is another of the lovers of profound solitude in the forest. I shot two in the earlier part of the year, and in the spring two more. They were then more sociable, and not uncommon. They hunt insects with considerable bustle. It will give an idea of their movements if I add that on shooting them at great heights I mistook, before firing, one of them for Vireosylva, and the other for Sylvicola pharetra; but I never saw it distinctly catch an insect on the wing. The stomachs contained several large seeds, a plant-bug, elytra of beetles, &c.

"But the species which chiefly contributed its numbers to make these lofty woods, during the winter so silent, resonant with the cheerful sounds of spring, was Merula Jamaicensis. They were not at all uncommon during the winter, coming at early dawn to the edges of the forest, with the solitaires and M. leucogenys, to feed; but in the spring I found them abounding. The little river, or rather brawling brook, that runs through this property, finds its way further down to a deep, dark gorge, where the mountain forest gathers its thickest gloom, and then disappears, like so many of our Jamaica streams, with a rush down a chasm or 'sink-hole,' to reappear, say the negroes, as the Rio Bueno, ten miles nearer the coast. Here these beautiful birds are in great numbers; the valley and hill-sides resound with their 'quank, quank;' and they have, besides, a loud, imperious call, uttered on the wing, very 'merulaceous'. I constantly hear there a beautiful, low song, with a note or two in it that reminded me of the solitaire, and with which I am unacquainted. I cannot but think it will prove to belong to this bird; but I hope, as soon as the weather will permit, to make further observations. I find it so numerous almost everywhere in the woods hereabouts as to suggest migration hither in this season. Just as with Sylvicola pharetra, I would take M. leucogenys as a standard of comparison. These last were abundant here in the winter, especially about orange trees. They are now common, but more dispersed, as a greater abundance of food and the necessities of the breeding-season would suggest; but there is no unaccountable change, apparently, in their numbers. With M. Jamaicensis they seem to me to bear no proportion; this is, however, only a suggestion.

"I see my limits preclude my adding, on this occasion, some notices on the nidification of Tyrannus crinitus, Myiobius tristis and others, as I had intended; for I would not conclude without some notice of an opportunity lately afforded me of observing the habits of one of our magnificent pigeons, namely, Columba Caribbea. While lately on a visit to Windsor Pen, on the leeward or western side of this parish (Trelawny), situated among the mountains I have described as the lower range, I was surprised to hear that the ring-tail was very abundant in a neighbouring pasture. I immediately went there, and found that the pasture occupied only the bottom of a narrow valley of small extent, the thick mountain woods closely investing the steep hills all round. About the centre was a fine tree, loaded with bunches of the semi-transparent scarlet fruit the negroes call cherries; but I have not yet ascertained what it is. On approaching the tree, to my great satisfaction I observed one of these birds reposing on a thick branch near the centre, 'sitting down' as the negroes say, evidently resting on the whole tarsus. I watched it for some time, but it was quite motionless. Another flew from the neighbouring woods, and alighted on the topmost twig of a lofty cedar. It was followed by a third bird, which immediately commenced feeding it, as usual with pigeons. I fired in a short time, and one only fell, a young bird with the down still adhering to the tips of the feathers. The old bird soon returned, and I secured it; it proved a male, thin, but in the very finest plumage. On dissection the contents of the crops of both birds proved the same, a pulp composed of a species of small fig. Their structure illustrated some interesting particulars. The lower mandible is remarkable for the wide divergence of its rami, which bifurcate only about one-third its length from the tip. The feathers thus come far forwards under the chin, and give the bird a peculiarly gallinaceous aspect, lost in a measure in the skin. This is succeeded by an œsophagus so distensible that I found I could thrust three of my fingers into it. The proventriculus is rather conical than globose, as the lower end is not narrowed by a stricture outwardly visible at the cardiac entrance; it is sparsely studded with glands. I found a sweet-wood berry in the interior in one case, the seed-vessel reduced to a green pulp, and the large seed whole. The stomach is capacious, but so slightly muscular that a vertical section of its muscles nowhere gives more than one-fourth of an inch. I was surprised to find no trace of gravel or grit within. The sweet-wood berries were simply denuded of their fleshy seed-vessels, the large seeds remaining quite uninjured. I understood the significance of this on uncoiling the intestine, sixty-nine inches in length. Throughout its whole length it presented the appearance of a necklace, from the succession of these kernels passing down the canal, the spaces between filled with green pulp, which was alone digested. I pushed some out at the cloaca quite uninjured. I found seeds of figs and cherries in the same state. Thus it can be seen of what deep significance is this peculiar form of beak. The whole alimentary canal undergoes an adapted change, and the mode of nutrition materially differs from that of other Columbadæ. The white-belly (*Peristera Jamaicensis*) feeds greedily on the fallen seeds of Laurus, which its powerful gizzard reduces to pulp; while the ring-tail digests the soft seed-vessel only. The influence of these two species on the vegetation around them differs still more widely. While the white-belly destroys hundreds of the plants on which it feeds, the ring-tail scatters them abundantly over the forests it frequents. I must reserve some further notes on this bird for a future occasion.

"W. OSBURN.

"To P. H. Gosse, Esq."

A List of the Birds of Banffshire, accompanied with Anecdotes.

By THOMAS EDWARD.

(Continued from page 6637.)

Carrion and Hooded Crows (continued). The eyes of dead animals, perhaps living ones too, seem to be a very favourite morsel with them; for if one is cast ashore, or met with elsewhere, those organs are always sure to disappear first. And if a fish should be stranded (the larger the better), oh! what a glorious prize it is!—what a treat!—how they seem to revel in it! Like many others, however, in a higher grade of society, they can't always keep all the good things of this life to themselves; for the gulls generally come in and claim a share, if not the whole; and here too, as in higher life, many are the disputes and tough battles they have in consequence. Besides all these, I have seen them attack other game. Whilst walking one morning along the Doveran, with a friend, and just as we arrived at the mansion-house of Eden, our attention was attracted to the other side of the water, by what seemed to us to be the faint cries of a child in distress. On looking in the direction we beheld two crows (whether hooded or carrion crows we could not tell from the distance) pursuing and tormenting a hare, by every now and then pouncing down upon it. Each blow seemed, as far as we could judge, to be aimed at or about the head; and each time that one was given the poor animal screamed piteously. These blows had the effect of stupifying the creature, so much so that she would whirl round and round for several minutes like a top. At other times, again, they would fell her to the ground. On these occasions the crows, cowards that they were, always seemed to attack her with greater vehemence than they did at other times. These onslaughts, however, had generally the effect of bringing the hare to her senses, if I may so speak; for she always sprang up as they were being inflicted, and seemed to redouble her efforts to get away. But it was all in vain. Another blow or two, and again she would become stupified, and either squat or reel about, and scream. We eventually lost sight of them, in consequence of their coming too close to the edge of the field, the wall of which hid them from our view. I was well aware, from what I had many a time seen, that crows destroyed leverets, young rabbits, &c., but was quite surprised to see them attacking an old one. I remember, whilst out on the hills at Boyndie, witnessing another, though less daring, attack. Concealed amongst some trees and bushes, waiting for a cuckoo which I expected to pass, I observed a half-grown rabbit emerge from some whins, and begin to frolic about close by. Presently down pops a hoodie; not a mischievous, murderous hoodie, as it seemed, but friendly, courteous and humoursome. Far away he went along the green sward, or rather approached the rabbit, frisking, pranking and jumping about just like a Merry Andrew: no one so merry as he. All of a sudden, however, as if he meant to finish the joke with a ride, he mounts the back of the rabbit. Up springs the latter, and away he runs; but short was his race. A few sturdy blows about the head, from the bill of the crow, laid him dead in a few seconds.

Rook (*C. frugilegus*). O yes, we have rooks, plenty of rooks, despite the murderous warfare carried on against them; and I am sure a more persecuted race does not exist. The time, however, will come when they will be more respected and cherished, and the valuable services which they render more correctly appreciated. As I have already said, despite the war carried on against them, we have several pretty large rookeries throughout the county. One at Forglen is said to be the largest in the district, and to have been one from time immemorial. As many as from twenty to twenty-six nests I believe have been counted here on a single tree at one time; and I am informed that the noise made during the breeding-season is so tremendous that it is often heard, on still evenings or quiet mornings, miles away. We have a small rookery here, amongst a few trees in the grounds belonging to Banff Castle, situated in the centre of the town, the occupiers of which seem to be in nowise incommoded by the traffic going on in the streets beneath them. Pied varieties of the rook are sometimes met with, as well as white and of a cream-colour. I have in my possession a live one of the latter colour; and as he is a most wonderful bird, this rook of mine, I must tell you something about him. Well, then, he was born at a place called the Torr of Traup; his parents were both black, as well as his brothers and sisters; but how he came to be whitish I leave you to judge. It so happened that when he was about two or three weeks old a young urchin chanced to alight on the nest, and, no doubt thinking he had gained a wonderful prize in a white rook, bore him off in triumph. A friend of mine residing near, having heard of the affair, succeeded in procuring the rarity for me. On his first appearance amongst us he did not seem at all pleased, and would have picked all our eyes out if we had been foolish enough to let him. My children, a pretty good swarm, flocking round him, he pecked at them most furiously, as in fact he did at all strangers; but to my friend who brought him, and with whom he had been living a short time previous, as well as to all my family, he became quite gentle; and when my friend asked him for a paw, he held out one of his feet, and shook hands as it were with him. In a short time he became as one of ourselves, and strutted about the floor like a soldier on parade, making friends with all but one, and to that one, a large tom-cat, he could not and never did become reconciled. The cat no sooner put his nose in at the door than he was flown at, and one blow from the bird's bill was enough for him. Away he flew like lightning, whilst Jack, as we call the bird, shouted victory by giving a loud "caw." A stranger could not enter the room without being attacked. A bare foot was a most glorious object for him to peck at. For the first six months he lived in the same room as ourselves. It so happened that we had a baby at the time. Now, the youngster was always put into its cradle shortly after breakfast. Jack, after he had been with us a short time, began to give us a song of a forenoon; so that the baby could get no sleep. The consequence was that we were obliged to keep him in an old garret till dinner time, when he was generally brought down. If he was not brought down then, and the door was shut, his trumpet was set going, and continued until he was released. One day, when we were all seated at the table, just about to begin dinner, a rap-tap was heard at the door. "Come in," cried one of the children, thinking it was some stranger. "Caw, caw!" roared Jack, for it was none other, and he continued to rap with his bill until the door was opened. There is one most extraordinary trait in his character, namely, when he has more food than he can consume he invariably hides it beneath a chair or such-like place until he is hungry. As to food, no choicer bit can be given him than a dead mouse; beetles and worms appear to be favourites, but a mouse is above all. He is also very fond of butchers' meat. On the broth-pot being taken off the fire one day shortly after we had him, down comes Jack from his roost, and marches to and fro the room several times in his own peculiar way, apparently taking no notice of the pot, when all of a sudden dab goes the bill right in the boiling soup, and out comes a piece of beef. Whenever the children had anything which he liked, it was a rare case if he did not, by some means or other, secure it for himself. If anything fell on the floor, and Jack was near, it was useless attempting to pick it up, for he would be there before you. I have said he sings; and so he does. But perhaps you never before heard of a rook singing; it is nevertheless a fact that this one does; and a most splendid noise he makes, by no means sweet I can assure you, being similar to the gruntings of a pig and the cackling of a hen, copiously intermixed with "Craw-wa-craw-wa," and generally ending with "Curr-warr-curr-war-war-warr." One more fact, and I have done. One day some neighbours heard the baby crying rather loudly; presently Jack came to the door, roaring "Craw, craw, craw," with all his might. Wondering what was the cause of it all, one of the neighbours went to ascertain, and found that the youngster had been left in the house with no one but Jack.

Jackdaw (*C. monedula*). This rock and chimney species is sure to be met with wherever favourable localities occur,—in our towns, amongst the higher rocks along our shores, as well as on precipices inland; and an old castle, or any place of that sort, is sure to have its colony of "kaes," with not unfrequently a mixture of starlings, &c. The jackdaw is another species that is very easily domesticated; and a very tricky, amusing fellow he is too. One almost of a pure white is now in the Banff Museum; it was killed near here, about two years ago. I once possessed a "kae," and I must tell you something about it. Well, I was down one day at the Middens, a place already referred to, seeing the boys catching sparrows, when a person chanced to pass with a gun. The boys, being very much annoyed by jackdaws, requested him to shoot them. This he did, at least he fired one shot, killing one and wounding another. The latter drew my attention at once, as well as excited my covetousness. After a little trouble I managed to obtain the bird. Away home I ran like a lamplighter, proud, happy and joyful. Well, I enter the house, and, holding up my prize to my mother, roar out, "See, mither! see, mither! I've got a kae!" "O, ye rascal, ye little nickern," said my parent; "did yer father na' tell ye that ye was to bring na' mair creatures here? Ye ha'e the hoose in a perfect swarm already." "Only this ane, mither," I says. "Na," she replies;" "it canna be here. Besides, it's past ten o'clock, an' time that ye was awa at yer school. Sae awa wi' ye, an' dinna bring the bird back here again." And out I was bundled, kae and all. Part with it, however, I could not; and I durst not take it to school with me, for I had introduced enough of this sort of Natural History there as well as at home. What was to be done? I will tell you, as near as I can remember. I had on a pair of trowsers much too large for me, especially in a certain place, and in them I put the bird, little thinking of the consequences. Away I marched to school, which was only a short distance. Up stairs I got, though with some difficulty, but, as was often the case, found the door locked. Prayers, however, not being begun, I was admitted, but gained the "fool's corner" for being late. This was a sort of narrow, raised platform, which placed those who had the honour of being elevated to it in full view of all the scholars. It had only one seat, an old, rickety, trembling chair; so that two were all that could be accommodated at one time. The school was kept and conducted by an old maid, and was attended by girls as well as boys. We all kneeled on the floor during prayers, our arms resting on our seats. Well, here I was, crowned like any king, having a great thing on my head about six times as high as any nightcap, and nearly the shape of that article. All was silent as death, save the half-moaning, half-groaning voice of the mistress, Bell Hill, as we called her. The devotions, however, such as they were, had not proceeded far when whisperings and stifled laughter rose audibly above the voice of prayer. These becoming louder and more frequent, I looked about to see what was going on; but to my great surprise I found more than one finger pointing, and all eyes turned, towards myself. I wondered what it could mean, as they had all seen me in the same dress and place before; but as I knew my trowsers would have been none the worse had they been in the hands of a tailor, I dreaded lest the bird had made his appearance; so I put my hand round to ascertain, and found that to be the case. Fearing the result, as I knew his doom if detected, I gave him a squeeze, in order to make him draw in his head. Poor fool that I was. No sooner did he feel himself pressed than he bawls out, "Cre-waw, cre-waw;" and the more I squeezed him the louder he roared. "The Lord preserve 's a'! Fat's this, noo?" cried Bell, starting to her feet. "It's Tom Edward again!" shouted the scholars *en masse*; "an' noo wi' a craw stickin' out o' his breeks!" To crown all, down went the old chair, which broke into fragments. Never shall I forget the uproar and confusion which took place, nor Bell's look as she stood, with both arms raised at full length above her head, addressing me nearly thus, "Well, master Edward, you are at your old work again. Did I not tell you only yesterday that I would not have my school annoyed in this way any more? Take the beast from him, Willie," she said, pointing to the largest boy, "and throw it out of the window." "No, I winna gie my bird t' nean; an' gin onnay one dares t' tak it, I'll brak his skull!" I cried, trembling all the while for the fate of the bird. Picking up a fragment of the old chair, I was determined, if any one did make the attempt, to put my threat in execution rather than lose my prize. This had the desired effect; for Bell, seeing how matters stood, and perhaps fearing mischief, said, "Well, you'll leave this immediately; and never come back, for you and your vermin are complete pests. Where and how you get them all, the Lord only knows. You cannot be here." This was glorious, as I had no taste for being confined in school; besides the joy of getting away scot free, bird and all.

Magpie (*C. pica*). Very sparingly distributed, and in some places scarcely known. Our keepers both shoot and trap them whenever opportunity offers. The magpie is one of the most bashful birds we have. When, however, they take up their abode beside farms, &c., they are by no means so shy, and, being generally held sacred by those near whose place they may be, frequently occupy the same tree or bush for many years. I knew of a pair myself that nestled in this fashion for thirteen years successively. Their young always disappeared towards winter each season, and never returned, but left the parent pair in quiet possession of the solitary tree.

Greater Spotted Woodpecker (*Picus major*). Several pairs of this showy bird have been procured within our district. Some, in fact, say that it lived in the higher parts of the county. Be this as it may, it is very rare, and its known occurrences few and far between. A most splendid pair, male and female, were killed about twelve years ago on the hills of Boyndie. It has also been obtained at Traup, Whinty, Park, Cullen, Auchintaul, Garden Castle, Kingerwie, and doubtless other places.

Lesser Spotted Woodpecker (*P. minor*). Far more rare, I should suppose, than the last. One sent me, fourteen years since, from Mayen, where it was shot, and another seen on the Lodge hills, are all that I am aware of; but very probably others have occurred.

Wryneck (*Yunx torquilla*). The late Professor Macgillivray, of Marischal College, Aberdeen, informed me that one was taken at or near Portsay, by an old pupil of his.

Creeper (*Certhia familiaris*). Wherever there are suitable woods these birds are sure to be found. We sometimes read and hear as extraordinary occurrences that nests have been found in the hearts of trees that have been sawn up. Now, to those acquainted with the facts these occurrences are easily accounted for. I know a tree myself which contains *two* nests, both with eggs. About seventeen years ago there was in the side of this tree a small aperture, about six feet from the ground, which led downwards to a cavity in the centre of the trunk. The opening was so narrow outwardly that it only admitted two of my fingers, but widened as it proceeded to the bottom, a distance of about eighteen inches. In this hole, at the time referred to, a pair of creepers built their nest and laid eggs, after which they disappeared. Next season a pair of blue titmice acted in a similar manner; and they also disappeared, doubtless in consequence of being tormented by boys, and of the narrowness of the entrance. I believe no more attempts were made to breed there after this, for the growth of the tree caused the hole to get less and less every year, and it is now, and has been for several years, so completely closed that the point of the finest needle could not be inserted. The tree, a sturdy beech, has the two nests and eggs in its very core. It is thus evident how easily these "extraordinary occurrences" may be accounted for.

Wren (*Troglodytes europæus*). The dear little wren, the lion of small birds, with his short, jerking little tail, I have known and admired from childhood. Who that has trod the woods in spring or summer has not heard a very loud, though by no means inharmonious song, proceeding from some bush or bank, and not admired the same?—and who is there, if he did not know the bird, that would not be surprised beyond measure at such a small creature being able to make such a loud noise? Of all the deserted nests I have ever met with, those of the wren would, I am sure, count twenty per cent. over any other species. I am unable to account for this, but perhaps it arises from their building several before they get one to please them. I once found one of their nests in an old tin kettle, which had become fixed amongst the branches of a holly. The bottom was out, so that the nest could be all seen. There were young in the nest when I found it. The wren, like other birds, does not sing so well in confinement. When in their native haunts, there is a pathos in their voice and a music in their melody that make the heart thrill with pleasure.

Hoopoe (*Upupa epops*). Three or four of these pretty birds have occurred here: one was taken at Duff House, in 1832, by a Mr. Mackay, in such a state of exhaustion as to allow itself to be captured by hand; another was seen by myself, a few years back, in the same place; and two others are said to have been since obtained in other parts of the county.

Cuckoo (*Cuculus canorus*). This is another sweet and darling gem. Well do I remember, when only a little fellow, rummaging about the Den of Rubislaw, near Aberdeen, how surprised I was on hearing the sound of "Cuckoo, cuckoo," from a small plantation close by, and how overjoyed I was when I obtained a sight of the bird; and now that I am old the sweet voice of the harbinger of sunny days still cheers me. They are not very numerous with us along the sea-coast, but are more frequent towards the higher districts. They generally appear about the end of April. It is said that they can retain their eggs for a number of days after they are ready for extrusion. I will relate, without comment, a circumstance of this sort which came under my own observation:—A female specimen, shot in a garden here, was brought to me to be preserved. On dissecting it I was agreeably surprised at finding in the oviduct an egg as perfect as if it had been obtained from a nest.

Roller (*Coracias garrula*). I am only aware of one specimen of this pretty and rare bird being obtained in our county; it was a most splendid specimen, killed on the hills of Boyndie, by Mr. J. Brown, gamekeeper to R. C. Nisbet, Esq.

Bee-eater (*Merops apiaster*). I give this species a place here from having heard that a greenish bird, somewhat less than a thrush, with a longish bent bill, and with two feathers of the tail longer than the rest, was killed in a garden between Huntly and Duff town, about seven years ago.

THOMAS EDWARD.

(To be continued).

" *On Hereditary Tricks in Animals.*"

By the Rev. ALFRED CHARLES SMITH, M.A.

THAT in every tribe of animals a fine progeny may be expected to spring from a good stock, is a fact which none will deny: indeed, that acute observer of nature, Aristotle, was wont to assert, ages ago, "Ἐξ ἀγαθῶν ἀγαθοὶ;" and Horace, too, sang, as every school-boy knows,

> "Fortes creantur fortibus et bonis:
> Est in juvencis, est in equis paternus virtus."

This is all plain enough, and we can easily understand it. Nor do I find much difficulty in perceiving how *bodily* peculiarities may become hereditary, even when such peculiarities are not natural, but the result of the interference of man. Thus it is notorious that from the long-practised habit of cutting off the tails of sheep-dogs (or, rather, of biting them off, which I believe is the detestable method of performing that operation generally in vogue) there is now a race of tailless sheep-dogs, which come into the world without any caudal appendage whatever, or at any rate with tails so little developed as to be generally considered wanting. And Mr. Waterton, in his second volume of 'Essays' (page 161), speaking of the strange custom which prevailed in this country not very many years ago, of removing the whole of the tail of horses, says, "You would have thought that Dame Nature herself has 'taken smittle,' as we say in Yorkshire, for I knew a farmer's mare in the county of Durham, about the year 1794, that produced three foals successively without any tails at all." So far we see how Nature, accommodating herself to existing circumstances, endeavours to produce in the offspring a *fac simile* of the parent; and this comes under our notice so often with respect to bodily defects and blemishes, as well in the human race as in other branches of the animal kingdom, that it causes no surprise, and we have learned in a manner to expect it. But when we pass from bodily to *mental* peculiarities, if I may so call them, and note the tricks and individual habits which are likewise sometimes hereditary and transmitted from generation to generation, the question assumes a very different aspect, and appears to me extremely remarkable, and well deserving of investigation; for neither Aristotle nor Horace, nor any one else, as far as I know, has attempted to explain to us the cause and origin of these strange tricks which are practised in certain families, and, like the gout and madness in the human race, seem to descend from father to son, in the most unaccountable manner; and I repeat that amongst the many remarkable traits of instinct and natural peculiarity which the diligent observer of the various tribes of animals meets with at every point, there are perhaps none which are so difficult to explain as these *tricks,* not peculiar to the whole class or species, but only to individuals, and which in many instances seem to descend as heirlooms from generation to generation. Any one who has at all studied the Natural History of animals will have observed in many cases such “hereditary tricks” as I have mentioned; but to take an instance or two selected from those animals which daily come under the notice of most of us, and which we have already taken as examples of the transmission of bodily peculiarities, let us examine the point in regard to dogs and horses. Every one at all versed in the mysteries of the kennel knows that hounds frequently inherit from their father or mother certain tricks; thus one hound has a peculiar manner of coming up to be fed, another walks across the kennel with an unusual gait, while a third has a method peculiar to himself of running up to his keeper; and all these tricks are precisely such as the fathers or mothers of these hounds had before them: so that the huntsman will often pick out such and such a puppy, and confidently predict him to be a good one, because his father was before him, and he has inherited his tricks; from whence he infers, and generally rightly, that with his peculiarities he has inherited the good qualities of his sire too. Again, I need only mention the well-known fact that the pointer's puppy, when but a few weeks' old, will begin to point of its own accord. And so with regard to horses, how often are we surprised to find that the colt will inherit the peculiarities of his mother: either he jerks his head in some strange fashion, or he stands in the stable in some quaint manner, or he has some unaccountable trick, just as one of his parents had before him: and Dr. Prichard has stated that young horses will frequently adopt the artificial paces which have been taught to their sires (see Zool. 1100). But to come down from generalities to a particular example: a curious instance of hereditary trick once came under my notice in a mare that was driven in harness: she had a strange habit of constantly licking the bit; she was very high-couraged, and this was her way of showing her impatience: at length her work was over, and she became a brood mare: in course of time her colt was broken into harness, and lo! he had the very same trick, and licked his bit too, and in precisely the same manner, rolling his tongue round the lower bar, as his mother did before him. Now, one would be naturally disposed to refer the tricks of animals which run in families, not to descent, but to imitation: we know how clever many animals are in imitating many things, and we should be disposed to attribute these tricks to that head: perhaps in some cases we should be right in so doing, but in the matter of the mare and foal the thing is impossible, since the foal never had the opportunity (even if we would grant him the inclination) of imitating his mother in this point, for he never saw her with a bit in her mouth.

Many similar hereditary peculiarities will doubtless have presented themselves to the experience of others; and, presenting as they do fresh subjects of interest, and fresh sources of admiration at the wondrous lessons which Nature contrives to instil into individual members of the animal kingdom, I would express a hope that they may be communicated through the pages of the 'Zoologist,' and thus form additional links of evidence on a subject with which we are as yet but imperfectly acquainted.

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
July 21, 1859.

The doubtful Eggs.—I have read Mr. Smurthwaite's "suggestion" (Zool. 6638) as to the eggs mentioned by me (Zool. 6563). It is not satisfactory to me. I certainly do not lay claim to a power of discrimination like Mr. Smurthwaite's, which enables him not only to determine that certain eggs, unseen by him, are blackbird's eggs, but also that a person, of whom he knows as much as he has seen of the eggs, is unable, from lack of experience or knowledge, to tell one "small bird's" egg from another, even when he has them before him. Still, while admitting this, and expressing my extreme admiration of Mr. Smurthwaite's remarkable gift of clairvoyance, I cannot quite put on one side the fact that the man who gave me the eggs declares that the bird he saw go off the nest that contained the eggs was neither a ring ouzel nor a blackbird, but that his impression at the time was that it was a "May thrush." With the eggs before me, in their nest, I ventured the opinion—a very decided one, too, it is, and I repeat it—that they were not the missel thrush's. However, I will forward those which I have loose to the Editor, if he will permit me, that others may judge by sight as well as myself. As to the sites selected for nidification by the redwing, I find that Yarrell and Selby both mention trees, of different sorts, as the usual ones. Perhaps Mr. Smurthwaite's "gift" enables him to decide that it is fir trees only which are "never selected" for that purpose by the bird in question.—*J. C. Atkinson; Danby, August* 8, 1859. [Please to send them.—*Ed.*]

Showers of Feathers.—On arriving in this country a few days since, my attention was drawn by a friend to a note on "showers of feathers," by Mr. P. W. Greene (Zool. 6442). As that gentleman has intimated that he wishes a further communication from me in regard to some feathers of waterfowl I had mentioned in a letter which found its way into the 'Zoologist' (Zool. 6324), I must say that such a simple fact (not a "theory") as that of feathers scudding in a breeze, which even a closet naturalist may witness any day by extracting a handful from his bed, without disturbing that of "the goddess Holda," and letting them loose at a window, I should have thought could have been called in question by none. And as to mistaking feathers for snow, I answer by asking, was the latter ever seen floating on water? I can hardly agree with Mr. Greene, that it requires specimens of goose-down and feathers to be sent "by post to England," some thousands of miles, in order to settle "the matter beyond doubt or dispute," when the experiments can be made, as I have described, so near at home.—*Thomas Blakiston; Woolwich, July* 24, 1859.

A Kite (Milvus regalis) *flying over London.*—On Friday, June 24th, between 5 and 6 o'clock P.M., I saw a large kite, with very long wings and a forked tail, flying at the height of about a hundred yards above Piccadilly (opposite the Green Park), in a north-easterly direction. As the bird moved slowly, it might have been easily shot at that time. Its appearance excited a good deal of attention among the passengers in Piccadilly, and probably it was seen by other readers of the 'Zoologist.'—*J. Altham; Manchester Street, Manchester Square, June* 30, 1859.

Note on the Cuckoo (Cuculus canorus).—I do not know whether the following note on the cuckoo is worth recording; but it appeared to me to offer presumptive evidence of a love of offspring which I had never before witnessed; neither had I any very settled opinion of cuckoos possessing any share of natural affection for their offspring. On the 7th of June I was collecting insects on Hampstead Heath, about 7 o'clock in the evening. On arriving at that part which is contiguous to North End, I started two birds, which flew from the middle of some dense furze-bushes; they rose with a sharp, snapping sound, and, after taking a wide circumvolution, again flew close to me, uttering the same sharp, snapping sound, which was immediately followed by a quick repetition of the call of "cuckoo, cuckoo;" this was repeated three or four times, the birds each time dashing within two yards of where I stood. They then flew together into an oak tree, and continued to "cuckoo," apparently in a state of great excitement. The impression on my mind was, that I had disturbed and frightened them away from a nest which contained their young, or that they were in attendance upon a young cuckoo which had not acquired sufficient strength to take flight. I searched, hoping, but in vain, to find either a nest or young bird, and so more satisfactorily arrive at the object of the anxiety of the pair of old birds. The snapping sound resembled that made by the goat-sucker when hawking in the evening after fern-chaffers.—*Frederick Smith; British Museum, June* 27, 1859.

The Crab and its Allies.

By C. SPENCE BATE, Esq., F.L.S., &c.

(Continued from p. 6630.)

The Crustacea, in the tabulated idea, consists of twenty-one distinct segments, of which that furnishing the organ of vision is the most anterior.

Sight is not the only sense with which these animals are endowed: senses of hearing and of smell are more or less perfect in most of them. The organs adapted for these senses are those which are developed as antennæ. Of these, in Crustacea, there are two pairs; the one internal, or anterior; the other external, or posterior. These organs differ both in form and relative length in different families and genera; but throughout the class they are adapted, the anterior to hearing, the posterior to smelling.

The anterior pair are always erect and on the watch,—jerking, moving and in play. They are universally formed of a peduncle supporting one, two or more filaments. In the lower forms these filaments are generally long and thread-like; in the highest they are very short, but the shortness consists in the decreased size of each segment, rather than in the number of the segments. Through the many forms of antennæ there appears to be one persistent scheme, however varied the aspect of the individual structure may be. The peduncle consists uniformly of three joints or segments. The first, that is, the one nearest the head, carries the acoustic apparatus, which consists, in the crabs, &c., of a bony cell that is circular, with depressed sides, and attached at one point only to the internal surface of the walls of the antennæ. The apparatus is supplied with nerves direct from the supra-œsophagal ganglion. In the lobster species the apparatus is long instead of round, and not so large in its relation to the organ; and Dr. Farre says it is always filled with sand, which, he presumes, acts the part of otolithes. The sand I believe not to be constant, and where presentit is the result of unintentional deposit; but it affords evidence that there is an orifice, small, though connecting the internal structure with external condition. Professor Huxley has discovered an apparatus of a similar character to that which Dr. Farre found in the lobster; but I have failed to perceive anything of the kind in the antennæ of the amphipod and isopod species. This probably arises from the less perfect development of the part both in size and structure, rather than from an absence of such apparatus. Again, upon the anterior antennæ—so that the absence is a circumstance to be commented upon—there exists, upon one of the filaments, and one only, however numerous they may be, a series of organisms that look like transparent hairs, but differ in construction from the true hairs with which they are mixed. They are not more slight, but are formed of a tissue that is evidently membranous and very thin; they are often divided, sometimes branched, and assume many different forms often characteristic of genera or species. The Crustacea on which they have not been perceived are few, the most conspicuous of which are those of

Talitrus and its allied genus Orchestia: these respire air, and we may presume that has something to do with the circumstance.

That these animals have the power of hearing, we think there is abundant evidence. It is told by Mr. Bell that at the report of a cannon they throw off their limbs; and in the same book we read that whole cargoes of lobsters have thrown off their limbs in a thunderstorm, to the great detriment of their marketable value; and we are informed that the following pleasant instance of maternal affection has been observed, which also illustrates the faculty of hearing:—One day, upon the coast of Cornwall, a fisherman, going the round of his crab-pots, saw a number of young lobsters swarming together. He watched them for some time before he attracted the notice of an old one lodged in a corner of a rock. This, from its post of security, kept guard over the young ones at play; and as soon as it perceived there was danger near, rattled its claws together, and they all fled to their holes. We know from observation in other species, and we see no reason to imagine it different in the lobster, that the young are torn out of the egg-cases in a very crude manner. The waves and the winds carry them far beyond the protecting reach of the parent. The number that are hatched would defy the most anxious mother to watch. The youngest are not mature when the oldest quit the egg, and I doubt if two or more weeks may not elapse between the freedom of the first and the hatching of the last. As I before stated, the spawn of a moderate-sized edible crab consists of about two millions of eggs. The manner by which I arrived at this conclusion was as follows:—I tore off about three hundred and weighed them, and then weighed the whole mass; and, after deducting the appendages which held the spawn in its position, I found, as near as possible, that there could not be less than two millions of eggs. We perceive, then, that in the foregoing anecdote the parent watching over the welfare of the young can scarcely be correct. But this, we think, is no reason why the statement of the fisherman of Goran Haven may not be true. Lobsters are known to be very gregarious, and seldom ramble far from their favourite hunting-ground.

We know the instinct of more familiar animals that live together will induce them to set a sentinel to watch, and give notice of approaching danger. The starling and lark among birds, and the wild horse among animals, are ready instances. We would therefore interpret the anecdote of the lobster by our knowledge of instances of instinct among these. And the fact stated, that those which played around the old one were young, corresponds with the history of other animals: they were protected because they were young, not because they were offspring.

But perhaps the fisherman of Goran Haven will not consent to this interpretation, but claim that instinct to protect the young will be greater in the parent than in any other, and of the two millions born some thousands die, as many more are killed, and they that are watched over are the youngest hatched, the proverbially most loved by mothers. To support the idea I would give an instance in a much lower form of the same class. It is told by Mr. Goodsir that on one occasion, while examining a female spectre-shrimp (*Caprella*) under the microscope, he found that her body was thickly covered with young ones, being carried about from place to place by the parent. And we know that the Arcturus, among the Isopoda, carries its offspring about attached to their long antennæ. Again, in the leech we find the same maternal instinct; and therefore, by parallel reasoning, it is not impossible that the lobster may know its own offspring.

But these statements have drawn us off from the point we had in view, which is, to show that lobsters have the faculty of hearing; thus, according to the fisherman of Cornwall, the old lobster *rattled* its claws, and the young ones fled at the signal to the protecting crevices of the rocks.

Whether sound, as known to the human ear, is appreciable to the organs of animals that live in the water, is a thing much to be doubted. Water is said to be a very excellent conductor of sound, which it travels four times faster than it does air. A bell struck in a diving-machine sounds with increased power; but then the sound is made in the compressed air, and not in the water; and, as far as my experience goes, no sound at all equalling that which we recognise as such is capable of being made in the water. Knock two hard substances together as you dive when taking a bath, and these will be not heard.* Sound is a vibration of air: can it be supposed that the vibration of water will produce the same result? Sound, therefore, purely as such, is a questionable occurrence producible in water. That an analogous phenomenon does take place is morally certain; but that it is a modified occurrence is evidenced from the altered condition of the organs belonging to animals that live in water. The otolithe in fish is not found in the ear of an animal that lives out of water, and the true cochlea is not known in any that live in it. In Crustacea the anterior antennæ supply the place of the ears.

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* Since this has been written, I have been informed that Gay Lusac rang a bell, under water, that was distinctly heard nine miles across the Lake of Geneva.

The antennæ which carry the acoustic organs surround and enclose the entire apparatus with its bony tissue, leaving, as far as our experience goes, no aperture in the crab, and a very insignificant one, in the lobster; and, as far as this part is concerned, the apparatus that receives impressions of sound is protected from the influence of external agencies by the stout integumentary tissue,—a circumstance that must preclude it from being at least a very effective organ under ordinary conditions. To obviate this and render it useful to the animal, the external walls are prolonged to a very considerable extent, the greater in comparison with the lessened perfectibility of the internal structure. Upon the slender and lengthened continuation of the integument, intermixed with the numerous more or less strong hairs, are placed the membranous ciliæ of which I have spoken.

These organisms are present, I believe, in all the higher orders of aquatic Crustacea, from the most perfect to the most immature forms, from the youngest to the oldest stage. In the larva of the crab the organ, in the earliest condition, is scarcely observable except by careful examination, by the aid of cautious dissection and a good microscope; yet it can be clearly defined from any of the other organs by the presence of these delicately-structured ciliæ, which assume a size, in relation to the antennæ, that gives them a preponderating importance. This agrees with observations made on the lower forms. In the sessile-eyed Crustacea the antennæ have no internal structure that I can detect that assimilates with the apparatus found in the higher animals, but exists as a member developed to support these membranous ciliæ, which appear to me to assume a high importance in their relation to the sense of hearing, particularly in embryonic and lower forms of Crustacea.

As sound is a minute vibration given by percussion to air, so a parallel result probably is excited by the same means in water, the difference between the two being equal to the difference of the density of the media. Thus, to make the vibration of the more dense material readily perceptible to the consciousness of the animal existing in it, long and delicate organisms, such as these ciliæ, must considerably facilitate the power. The term of auditory ciliæ appears to be very applicable to them. And in the Amphipoda we have traced what we believe to be a nerve traversing the lower side of the organ to the extremity of the peduncle, and to the root of the first of these appendages, which are repeated throughout the length of the filamentary continuation, which appears as an extended base for their support. The number of these ciliæ bears no relative proportion to the length of the antennæ: they crowd together where the limb is short; upon the more extended organ one is present at the distant extremity of every articulation.

Hearing is given to us for a twofold reason: it is a source of enjoyment, and a power that protects us from danger. Music is a pleasure that cannot be surpassed by that derivable from either of the other senses. And the eye, though it may more directly point to an approaching danger, is scarcely so extended in its consciousness in conveying its approach as the ear. Ever since the mermaids have ceased to sing, and the destroying hand of Science visited with the dredge the secrets of their magic caves, deep in the bottom of the ocean,—ever since the syrens of the Greek poets have been found out to be but painted and hired viragos, — the idea of a lobster or a crab listening to soft music has not entered into the most wild poet's fancy. The note that can "soothe the savage breast" cannot tame the fish: it cannot be struck beneath the waters. The breath of mighty winds and the heavy lashing of the shore-broken serges are the only sounds that can penetrate the deep. These have been fancifully termed the *music* of the sea by those whom a generous license of humanity has permitted to alter the meanings of words, that they may awaken a pretty idea at the expense of truth. Birds and animals may enjoy the concerts of the air; but where there is an eternal silence an organ formed for enjoying sounds must necessarily be a work of supererogation.

The organ in this class of animals is formed for protection only, to animals beneath the sea: this is evidenced by the fact that in those Crustacea which are purely terrestrial the organ is never developed. This is evidently no (erroneously so called) freak of Nature, but a persistent law, since we perceive that the importance of the organ is gradually decreasing. In the sub-terrestrial amphipods, the sand-hoppers (Talitrus and Orchestia), the upper antennæ are rudimentary; in Ligia, among the isopods, we perceive the same degenerated state of the organ to exist; but in the land Crustacea, which are mostly isopods, the upper antennæ are microscopically present in the adult stage, and this although they are more proportionally important in the young. This argues, I think, that the antennæ developed to convey impressions by sound are organs adapted for the water only.

But in Crustacea there are two pairs of antennæ; the first, or anterior pair, is that to which is attributed the sense of hearing; the posterior is supposed to have the power of smell.

It would scarcely be fair to those who have not given much attention to the subject, and consequently take for granted the unproved assertions of the writer, to let it be supposed that these opinions have been and are universally adopted,—that the senses here given to the antennæ belong respectively to each.

The subject was first introduced by Professor Milne-Edwards, who attributed the sense of smell to the anterior pair of antennæ, and that of hearing to the posterior. This opinion, taken upon so great an authority, was universally accepted and taught by naturalists, until Dr. Farre threw doubt upon it in a paper read before the Royal Society in 1843, wherein he showed strong reasons for believing that the opinion of Edwards should be reversed in relation to the lobster. But here the subject hung fire. Few saw the paper of Dr. Farre, and of those who did there were fewer still who cared to verify the fact; and so the old notion of naturalists still retained its place in the works of those who wrote upon the subject. One who at the age of twenty-three was elected fellow of the Royal Society, in his capacity of assistant surgeon in the navy was attached as naturalist to an expedition to the southern hemisphere, where, obtaining some very transparent stomapod shrimps, he examined them with his microscope while they were yet in a fresh state, and thought he detected a strongly refracting otolithe in the basal joint of the upper antennæ, and stated it to be his opinion that the anterior pair was the seat of the acoustic apparatus. This corroboration of Professor Huxley's I have more recently traced in the crab,—the relation of the senses to the respective antennæ,—in a paper published in the 'Annals of Natural History' for 1855, in which I showed that there existed an internal structure that bore no very distant analogy to the cochlea in the mammalian ear. Thus observations in three persons arrived independently at the same conclusion, and these in distinct divisions of the same class. I think, therefore, we are not rash in accepting the idea thus aimed at to be the truth, even though so recently published a work as the 'Conspectus' of Siebold adheres to the opinion of Edwards; but Siebold does not appear to have been aware of the researches of Farre, Huxley, &c.

But this is evidence upon structural grounds only, aided by inductive reasoning. The vivarium is a modern instrument in Science, that, when carefully watched and studied, will be found a valuable assistant in the pursuit of Natural History. The water is not so clear, the animals are not so happy and natural, as the same water and the same animals in their original position. Few are the animals that will not pine in prison; and those that do not, soon put on appearances that are unknown in the free state. But still, with all the drawbacks, the vivarium is invaluable to naturalists; and it is only in them that the habits of the frequenters of the ocean can be studied as living animals. The shrimp and the crab, out of the vivarium, and their congeners, are but known to many when boiled red or dressed in a salad; and those that may have been seen alive were in a frighted condition, as they ran from the cover of one stone upon the beach to that of another, or struggling to escape from the fisherman's trap. But, thanks to Mr. Warington and Mr. Gosse, the awkward, hopping prawn, that was always jumping it knew not where, and falling it knew not how, and so difficult to hold, is found to be among the most graceful animals that float through the element in which it lives. Under the posterior portion of the body, long, sweeping, plume-like, feathery legs (pleopoda) beat the waters more gracefully than fish's fins, as the proud beauty traverses the ocean many fathoms deep.

In a paper published in the 'Annals of Natural History' Mr. Warington tells us that he has observed the hungry prawn watching for its food; and when it has been given to him, a piece will occasionally fall to the bottom without being perceived by the animal, which might perhaps have been more attracted by some other object at the moment. But the long, sweeping antennæ (the posterior pair) are always on the watch; they slowly beat the waters in every direction; and Mr. Warington says that the moment one of them cuts the column of water through which the piece of food had fallen to the bottom, the animal becomes cognizant of the fact, and turns and hunts it up, or chase it through the water as Mr. Warington drew it forwards on a piece of stick. My friend Dr. Dansey has recently assured me that in his vivarium all the smaller fish fall a prey to the prawns, who hunt and chase, giving them no rest until they capture them. The instructed scent of the harrier and foxhound is pointed out as a wonderful possession; and so it is; but is it less wonderful or less true that the prawn can chase its prey at the bottom of the sea? What has been proved with respect to the imprisoned animal in the confined water of the vivarium, is more than probably increased in force in the free creatures of the sea. In shallow estuaries whole shoals of different species darken the stream in their rapid passage up, in full cry, probably after some fast-swimming prey; the prawns hunting near the bottom, the opossum-shrimps near the surface. Mr. Couch tells us (Zool. 5616) that the nipper-crab in his tank gave chase to a fish that was put in with it, soon seized it with both its claws, and killed it; it devoured the belly and lower part of the head, and, being satisfied, rejected the remainder. The same crab took a fly that chanced to alight on the water. How astonished a sportsman would have been if his artificial caricature had been so taken! He would be catching crabs with a truth.

Here we have, upon the testimony of Mr. Warington, evidence of the possession of smell exhibited in the shrimp. Smell it could only be; for the piece of meat passed to the bottom unnoticed and unattended to by the hungry animal on the watch for food, until the long antennæ swept the track through which it fell; it then immediately began to hunt, and hunted until it found it. There can be no doubt, I think, that consciousness of the presence of food was obtained through the long antennæ, and this by the scent left from the food in its passage through the water. This organ is always present in Crustacea, both in terrestrial and aquatic species; it consists of a peduncle or base, and flagellum; the latter, in land species, generally have the joints fused together.

There is but one sense more belonging to animals; and there is no reason to suppose that taste is less likely to be present in those of a low type than when the general organization is more complete. The chief object of taste is to recognise between the food which nourishes and that which is injurious. Even in the pampered appetite of civilized man the meal that is enjoyed is more generally nutritious than that which is not agreeable to the taste. The Crustacea seek their own food, and choose that which they prefer. The crabs, or short-tailed Crustacea, devour only fresh, wholesome animal diet, and prefer living animals that they can overpower to that of other food; this they carry sometimes even to cannibalism, eating others of their own or nearly-allied species, but only when hunger is very sharp. The lobsters, or long-tailed Crustacea, feed generally, it is said, upon carrion, and, as far as I am aware, are free from the charge of cannibalism. The shrimp and its near allies feed voraciously on animal refuse, and are as active as ants in clearing the bones of a drowned puppy or cat. It is for the latter supply of food probably that they frequent the shallow waters and muddy banks of estuaries, and the shore-line of sandy inlets. The sessile-eyed Crustacea are mostly carnivorous, and sometimes cannibals : I have seen the Orchestia gluttonously feeding on an earth-worm, and others have observed, when quantities abound, that the stronger prey upon the weaker; and my friend Mr. Swain tells me that once, at a picnic, in Whitsand Bay, where cart-loads of Talitri were seen upon the shore, a handkerchief which a lady dropped for a few minutes among them was picked up completely riddled with myriads of tiny holes. This would lead us to infer that they are vegetable as well as animal feeders,—a fact that is confirmed by the observations of the American naturalist Say, on a fresh-water amphipod of Philadelphia, which is not, he says, "very choice in selection of food; it tore out of the shell a young Lymnæus calascopium, and also ate some vegetable food." The latter we may also infer, to a greater extent, may be the food of some species among the isopods. We find that the Idotea partakes of the colour of the weed among which it is found. Not perceiving that it has the chameleon-like power of changing its colour at will, I am inclined to believe that it is a vegetable feeder, and that the colour of the animals is dependant upon the colour of the food made use of. The Idotea taken among the green Ulva is of a complexion scarcely distinct; while that found among the dark Fuci partakes of the same brown hue as the weed. But the general habit of these is to hunt among the tall zoophytes and the creeping weeds for infusorial animals that dwell among the branches.

But whether they prey on living or dead, either animal or vegetable food, they seek and choose out that which they prefer,—an evident sign that the pleasure of taste is sought to be gratified as well as hunger appeased; for the hungry crab will refuse the tainted meat which the lobster devours.

The sense of taste has no especial organ. Even in the higher animals it is only a developed feature in the consciousness of the surface upon which the food is brought into contact; and we can scarcely expect to find it other in that of lower forms of life, where probably it is present in a considerably less perfect state.

The food which the animal devours remains not in the mouth, but, after being torn off by the powerful mandibles, is passed instantly through the short œsophagus into the stomach, where it undergoes the different processes of trituration and digestion. The food is swallowed eagerly, sometimes one extremity of a piece being in the stomach before the other is in the mouth. I recollect once feeding a poor little fellow that appeared to be very hungry, having been neglected probably for some days. The food I gave him, a piece of fresh mussel, he gluttonously endeavoured to bolt; but it was too large and too thick; he got one half into his stomach, but the other he could not get into his mouth; he struggled and pulled and tugged in vain; the piece was too large to swallow, and his mouth was so widely stretched that he could not bite it in two; so he tried to pull it back again, but failed to do so, pull and tug as much as he would. He tried and tried in vain; and repeated failures evidently produced alarm. His eyes began to stare, and he tossed about his arms. He raised himself upon his hind feet, and, beating the water with the others, he ran away erect. He strained himself to that extent that he fell upon his back a struggling, choking crab! and if he had not been already green, he would most assuredly have gone black in the face. He was in such a fright! I came to his rescue, and pulled the piece of meat from his greedy mouth, to his great comfort and greater relief. He took care not to eat so fast again, and to bite meat before he swallowed it, all the rest of his life, unless a crab is like some individuals among a higher order, who never learn by experience.

The crab is not a daily feeder; few carnivora are. Having satisfied his appetite, the greatest dainty may live in peace within his reach, as a nipper-crab of Mr. Couch's did with a Montagu's sucker for several days, although it fell a prey to him at last.

The stomach in Crustacea is very complicated. It is formed for grinding up the food. Three calcareous plates, with serrated surfaces, meet together at a common point, and do the work of mastication. Digestion then goes on, and the altered food mixes with the bile as it passes out of the stomach, when it is ready to be taken up as a repairing-supply to meet the general wear and tear of the tissues of the body.

The stomach differs not much in Crustacea generally; it is more strong, and with calcareous plates and teeth, in the larger kinds, but has ciliated plates and fine hairs in the smaller and weaker forms.

The mouth of the crab is protected by several pairs of limbs that overlie the mandibles, and the outermost are formed into a broad operculum that encloses and protects the whole. In the lobster and prawn the operculum is less perfect, and the leg-like character of the appendages more apparent. This increases the lower we proceed, until the leg is developed in all its proportions, as seen in the Edriophthalmic Crustacea, where there are present two pairs more than belong to the higher types. The Gnathopoda, which in the higher forms merely brush and protect the mouth, in the lower fulfil the office of hands, and supply the mouth with food.

The hands of the crabs belong to the third pair of legs, and but little fulfil the duty of such, except when climbing over some uneven rock or surface. They are developed into a finger and thumb claw, and have the power of firmly grasping any substance. In supplying themselves with food the claws are very efficient organs; but they are somewhat differently used by some than others: the crab is more gluttonous in its character, and snatches the food to its mouth and greedily devours it; not so the graceful prawn and curious soldier-crab.

Look in the vivarium, and see the transparent prawn. Look how it holds the mass of food in one hand, and tears off small pieces with the other, which it lifts to its mouth and eats, not in a crab-like manner, but in a quiet, easy, comfortable way, as if it knew how to enjoy an agreeable occupation; nor is it so selfish but that another, without raising its anger, may snatch a piece away; but the stranger must not take too much. What gentleman likes to lose his dinner?

But the soldier-crab I have most watched, and look upon as a particular pet. It lives in the shell of a dead mollusk, which it occupies and carries about as a tenant-at-will. It has one of its claw-formed arms longer than the other; with the shorter, which in most species is the left, it holds its food, and with the right he tears it away piece by piece and puts it into his mouth. But this sociable individual does not often dine alone: Mr. Gosse, in one of his pleasant sea-side books, tells us how his meal is shared by a beautiful nereid worm. The soft and serpent-like annelide smells the repast that the master of the house is enjoying, and, like a wily guest, takes care to be present at the meal, even though unbidden. See! beneath the crab the beautiful head glides out. While the self-confident owner is devouring one piece, and in his full enjoyment looking round and perhaps admiring the submarine scenery, the worm attacks that which is in the other hand; by little and little the crab feels it going, and makes an effort to stop it on the way; but it evidently can be seen, by his manner, that he cannot believe that any one would be so rude as to steal his dinner out of his very mouth, and does not think much about the undevoured food, but which nevertheless is slowly, gradually and surely taken away.

Did the reader ever hold a handkerchief or any other thing firmly in his hand, determined that the object should not be lost, and after some time has looked down and perceived that it was gone?

Just so with the crab: he feels it going, and he grasps it tight; after a time the hold relaxes, the meat is pulled again, and the hand is grasped the tighter; but confidence in its security again loosens the grasp, and the cautious thief steals more gently, but perseveres until the meat is procured, and then quietly retires, and within the shell devours the meal that his friend procured for himself. Having eaten his first mouthful and found the food most palatable, the crab looks down and finds his dinner gone. He knew he had it in his firm grasp, and will not believe his eyes. He looks and turns and twists about. It must have fallen down; he looks, and, like a human being, looks everywhere but where it is; and evidently you can see it in his face that the last suspicion in his mind is that his friend has stolen his dinner. He would not do it, sir! Poor, confiding crab!

In these cases we perceive that the food which they have eaten has been brought within their reach by some fortunate circumstance; but occasionally hunger tempts them to go in search of prey; and herein they frequently exhibit considerable ingenuity: we have it upon the authority of a correspondent in the 'Magazine of Natural History' for 1831, that a crab has been observed to make an effort to attack an oyster in its strong recess; but the cautious oyster, by some instinctive perception, knew that an enemy was near, and invariably closed his shells whenever the crab tried to insert his claws between them. But the crab was hungry; he made several attempts, and met with the same result: the oyster had an objection to be eaten.

It may be in the memory of others besides myself, that in the Natural History instruction of school-days we were told how a famous fox would catch a crab. The sly and clever Reynard knew that to catch him in his mouth the crab had claws to bite, and that he might catch him by his nose, of which he was very careful, besides his objection to dipping it into the salt water, which in itself is not pleasant. So to prevent any disagreeable consequence, as well as to succeed in his desire, he teases the poor crab with his soft, bushy tail, which in weak revenge the crab firmly grasps in his strong nippers and there holds firm. The wicked and cunning fox then runs away, and pulls the crab ashore, where he destroys and devours him at his will. Gulliver, in his Brobdignagian travels, tells us how birds of prey, in that remote country, have the same habits as those of more known lands; and when they have a mollusk of which they cannot crack the shell, fly with it in their mouths to the higher regions of the air, and let the poor thing fall. The bird then descends to the earth, and devours the animal yet writhing in the broken shell.

Every one knows how the thrush carries the snail to a favourite stone and smashes the shell, and what a charnel-house the spot looks like with the remains all strewed about. But these may not be thought to rank as cases analogous to the task which the lobster has before him, to dine upon his marine neighbour; although they are each respectively examples of instinct peculiarly apposite to the required circumstances. But nearer the mark, and founded upon the authority of Carreri Gamelli, we are informed that the orang-otang (*Simia Satyrus*) feeds upon a large species of oyster, fresh taken from the water; and that, fearful of inserting his paws into the shell, lest the oyster should close and crush them, his custom is to insert a stone between the valves as they are peacefully opened in the calm enjoyment of the incoming tide. He then drags out his victim with safety. Ever since the veritable history has been written and painted of the selfish ape that used the cat to draw the burning chesnut from the fire, few things have been thought beyond a monkey's wisdom, and some metaphysicians allow them a certain degree of reason on account of the superiority of their instinct; and therefore it appears not strange or new. But few will perhaps be prepared to learn that this is the plan the crab pursued. When he found that the oyster was too wide awake, he watched in patience until his prey, supposing all things to be safe, opened the valves again; he then quickly inserted a stone. Alas! for the poor oyster; it never closed its valves again.

But it is not always that the devourer comes off so successful as the crab in this instance. My friend Mr. Barlee once dredged a mussel holding tight the claw of a crab. I think the history is evident. The crab, as in the former instance, wished to dine at the expense of his neighbour, but was not experienced enough to get off scot free. The mussel did not close the shell in time to keep out his claw. He must have been a very young crab, without doubt a green one; for when he put in his claw the mussel closed, and held it tight. Anchored to the spot by the byssus, the mussel grasped the arm of the crab, and never let it go again. We can only judge the sorrow of others by imagining ourselves in similar conditions. Fancy the boy that is tempted to steal apples finding his arm caught in a trap; but how much worse if that trap should never let go again. Such was the trap that caught the crab. What would the boy do? Not all man's boasted reason or grand philosophy could make him equal the instinct and power of the crab. After every attempt to free it from the shell had proved how useless was the effort, the crab went away and left his arm behind,—a capability he has at will.

These observations upon the instinct that Crustacea exhibit in procuring their food are exhibited from species that belong to the shores of Great Britain. But the power has been as strongly exemplified in exotic tribes, as may be seen by the habits of a species of Grapsus upon the small islet of St. Paul's. The noddy, a species of tern, builds a simple nest with sea-weed. "By the side of many of these nests," says Mr. Darwin, in his pleasant 'Naturalist's Voyage,' "a small flying fish was placed, which, I suppose, had been brought by the male bird for its partner. It was amusing to watch how quickly a large and active crab, which inhabits the crevices of the rock, stole the fish from the side of the nest as soon as we had disturbed the parent birds. Sir W. Symonds, one of the few persons who have landed here, informs me that he saw the crabs dragging even the young birds out of their nests, and devouring them."

I have before alluded to the Crustacea as being fond of vegetable food as well as animal. A striking example we have, upon the same authority as the preceding. A crab, closely allied to, if not identical with, the Birgus latro (a genus near to our soldier-crab), is found on all parts of the dry land, and grows to a monstrous size, on the islets around Keeling Island: they live upon the cocoa-nuts that fall from the trees which flourish there. "The first pair of legs terminate in very strong and heavy pincers, and the last pair are fitted with others weaker and much narrower. It would at first be thought quite impossible for a crab to open a strong cocoa-nut covered with husk; but Mr. Liesk assures me that he has repeatedly seen this effected. The crab begins by tearing off the husk, fibre by fibre, and always from that end under which the three eye-holes are situated; when this is completed, the crab commences hammering with its heavy claws on one of the eye-holes till an opening is made; then, turning round its body, by the aid of its posterior and narrow pair of pincers, it extracts the white albuminous substance. I think," continues Mr. Darwin, "this is as curious a case of instinct as ever I heard of, and likewise of adaptation in structure between two objects apparently so remote from each other in the scheme of nature as a crab and a cocoa-nut tree." "It has been stated by some authors that the Birgos crawls up the cocoa-nut trees for the purpose of stealing the nuts: I very much doubt the possibility of this; but with the Badanus the task would be much easier. I was told by Mr. Liesk that on these islands the Birgos lives only on the nuts which have fallen to the ground." "To show the wonderful strength of the front pair of pincers, I may mention that Admiral Morseby confined one in a strong tin box, which had held biscuits, the lid being secured with wire; but the crab turned down the edges and escaped. In turning down the edges, it actually punched many small holes quite through the tin!"

But Crustacea, upon the whole, must be viewed as carnivorous animals; and, as I have before remarked, they are occasionally cannibals, but this only, I believe, when in an extreme state of hunger. Like most Carnivora, the crab does not feed every day; and perhaps occasionally when it wants food it cannot get it; then it is that it attacks its own species. In this way generally the smaller forms fall a prey to the greater; but sometimes an attack is made upon one that, though weaker, is big enough to show fight, and can greatly annoy with the powerful nippers the one that is feeding upon him; it is then the instinct is exhibited by the stronger in biting or so wounding the claws of the weaker that they are thrown off, and the foolish creature that has thrown away his only protection easily becomes the prey of his stronger brother; at least so infers Mr. Gregson in the 'Zoologist' for 1857, from observations on Carcinus Mænas in his own vivarium.

These several observations in different species all exhibit a higher amount of instinctive power than animals so low in the scale of beings are supposed to enjoy; and, moreover, it shows that in the procuring of their food they are not simply the sea-scavengers, and are no more to be considered as such than many fish. It is probable that the smaller tribes of Crustacea come more under this appellation, since the Talitri feed upon the offal that is found beneath the festering weed thrown up by the sea, which they generally devour where they find it; but upon being disturbed they run off to their holes in the sand, and, like careful purveyors, carry away with them some food, that they may devour at their more convenient pleasure.

The opossum-shrimp (Mysis), which abounds in such numbers in most estuaries, forming a band many feet wide, is a very greedy feeder "seizing and eating every animal substance which the current or tide carries along with it, and contending like vultures for the possession of large masses. When confined together in a vessel of sea-water they will even act the cannibal, killing and devouring one another." (Mag. Nat. Hist. iv. 258). The unhallowed creatures!

(To be continued.)

How to cure Grease in Insects.—Nothing can be more disfiguring to a collection of insects than grease, a single *oily* specimen being sufficient to spoil the appearance of an entire drawer. The usual method of removing it is, to immerse the insect for a certain period in camphine, rectified spirits of turpentine, borneote of petroline, &c., according to the fancy of the respective operators; and, after having dried it with blotting-paper, to envelope it in magnesia or finely-powdered chalk, which is afterwards removed with a camel's-hair brush. But, however well this may be done, the insect rarely possesses, after the operation, its original fresh and downy appearance; it is always liable to become again greasy, and not unfrequently, especially in the case of the Geometræ, the wings become hopelessly crumpled; at any rate, I have experienced all these misfortunes. But irrespective of these objections, whether well or ill-founded, "prevention is better than cure;" and as an unfailing means of procuring the former desirable result, I submit to your readers the subjoined method, which I have tried, with complete success, for some years past. As the Bombyces are especially liable to grease, let us take Notodonta dictæa (male) as an illustration of my system. When the insect has been on the setting-board a sufficiently long time to render the contents of the body firm and viscid (not *hard*), remove it. Take a pair of fine-pointed, sharp scissors, and cut, from the under side of the body, a small slip, *i. e.*, beginning at the extremity of the abdomen, on the left-hand side, cut up to the thorax; and having done the same with the right side, remove the slip thus made. Care of course must be taken not to cut too deep. Take now a penknife, and, inserting the point at the thorax, draw it gently down each side of the body. This can readily be done if the contents are not *hard*, and in most cases the whole can be picked out in one lump with the point of the knife. This being prosperously effected, carefully break off the body *immediately* (otherwise the grease will run into the thorax, and your labour be in vain); and having done this, take a fine pin, and run it through one *side* of the empty body, for about one-eighth of an inch. Let it remain for two or three days, and then immerse it any of the above-named fluids for about six hours. Afterwards dry it on blotting-paper, which in most cases will be found sufficient. Very feathery bodies, however, will be improved by covering them for a day with magnesia, after having been dried for a quarter of an hour or so upon the blotting-paper. After this process the body will be found wholly free from grease, and may be re-united to the insect with a little strong gum. If kept for years it will never grease; and a second advantage is, that, all moisture being removed, the pin can never be crusted with verdigris. The object of running a pin through the side is, *first*, that by means of it the body can be removed from the camphine, with a pair of scissors, without injury; and, *secondly*, for the purpose of attaching a little paper label to it. It would obviously be a troublesome business thus to wash out each body as it became ready. Having therefore, suppose, twelve pupæ of N. dictæa, which emerge at different times during a fortnight, I clean each as it is ready, and, having broken off the body, attach to the pin a little paper label, numbered 1, 2, 3, 4, corresponding with a similar label attached to the insect. This is of course that each insect may obtain its own "corpus." The number must be written in *pencil*, as, if in ink, it will be obliterated. The body will sometimes (for what reason I know not) be filled with a dark fluid. In this case take a little roll of blotting-paper, and fix it in the body. This will absorb the moisture. Afterwards immerse it in the camphine, &c., as above. The method may appear elaborate, but in reality is as simple as possible. It demands a little trouble, no doubt; but what of that? The result more than repays you. It may also be objected that this is "patching" an insect. I can only say that I am willing to mix up, patched and unpatched, the above dozen insects, and to challenge any eye to detect the difference. The only drawback to my method that I am conscious of is that sometimes the body *contracts*. This, however, may almost always be obviated by not "operating" too soon, and by letting the body remain some days before immersion into the camphine. A little practice and perseverance will soon make perfect, and no one deserves the name of entomologist who will not devote a little of each to make his collection worthy of inspection. Though my plan, be it good or bad, applies of course chiefly to insects taken or bred by myself, I adopt it, whenever I can, with those I obtain from my correspondents. In this latter case the operation is much more difficult, owing to the *hardness*, and in some instances the *antiquity*, of the specimens sent. I "clean out" *all* my own insects, even the little "pugs." I may remark here, however, that females seldom grease. If the wings of the insect, when removed from the setting-board, are not thoroughly dried, the insect can of course be replaced. It may perhaps have occurred to some of your readers (as it has to me) that when an insect has been taken at sugar, it (the sugar) will exude, and spoil the body. In this case I also break off the body, and soak it for half a day in water, and then place it on blotting-paper before a fire for some hours. This completely removes it. I shall be happy to give any further information to any one who may think it worth his while to apply to me for it.—*Joseph Greene; Cubley Rectory, Doveridge, Derby.*

Capture of Pieris Daplidice on the Kent Coast.—Mr. H. J. Harding, whose name as a most assiduous collector is so familiar to us all, has been fortunate enough to take two specimens of this, the rarest of British butterflies. They were taken at Kingsdown, close to the sea-coast, and had probably just been blown over from the coast of France. The days of capture were the 1st and 18th of August.—*Edward Newman.*

Deilephila Galii.—An unusual number of the larvæ of this insect have been found near the south-east coast, feeding on the lady's bedstraw. I have heard of more than seventy; thirty-six have fallen to the lot of one entomologist. Other examples of the same insect have been found on Fuchsias near London.—*Id.*

A Ray of Light on the Food-plant of Sphinx Convolvuli.—A friend of mine, long resident in Paris, has, year after year, found the larvæ of Sphinx Convolvuli feeding on cultivated balsams in the gardens of the Luxembourg. I have seen the moths bred from them, and there is no doubt whatever about the species. Balsams are now in perfection, and entomologists will do well to look under them for the very conspicuous droppings of this huge caterpillar. A chrysalis has been dug up in a potato field near Brighton, and sold for Acherontia Atropos.—*Id.*

Gastropacha ilicifolia.—On looking for larvæ on the Moors, with Mr. Baker, of Heeley, we found some larvæ very like potatoria. On returning home we called on Mr. W. Green, who was the original discoverer of G. ilicifolia, and who informed us of our good fortune; he also, the day before, received some larvæ from off the Moors, amongst which he was very glad also to find G. ilicifolia.—*W. H. Smith; Ecclesall New Road, Sheffield; August 15, 1859.*—[*'Intelligencer.'*]

Another Specimen of Sterrha sacraria.—I am indebted to Mr. Button, of Peckham, for the sight of a living specimen of this rare British insect: he took it at a lamp on Clapham Common, on Thursday evening, the 11th of August, and brought it to me the same evening, purposely to afford me the pleasure of seeing it alive.—*Edward Newman.*

Capture of Noctua flammatra in the Isle of Wight. — I am happy to announce the capture of a new Noctua, by Mr. Rogers, in the Isle of Wight. I was in company with him at the time, and saw the insect alive. At that time I was unable to determine the species, assigning it a place between N. triangulum and N. rhomboidea. Mr. Rogers kindly allowed me to make a drawing of his specimen, which I took with me to London, and was enabled, through the kindness of Mr. Bond, to compare it with specimens of "N. (ochropleura) flammatra" in the British Museum, with which it proved to be identical. This species is widely distributed, occurring in India and throughout Europe, and, with very slight difference, in Brazil. It will be instantly recognised by the intensely black collar, more conspicuous even than that of T. pastinum; otherwise the resemblance to an indistinctly-marked specimen of N. triangulum is great, but it has a black central dash from the base of the fore wings. It is rather singular that this is the third new Noctua which has occurred in the Isle of Wight within the last few months.— *W. D. Crotch; London, August* 26, 1859.

Heliothis scutosa near Poole. — On Monday, the 11th inst., as I was out with my pupils collecting in this neighbourhood, one of them (Mr. D. A. Neilson) had the good fortune to capture a specimen of this insect, which is now in my possession.— *C. R. Green; Parsonage, Hamworthy, near Poole, July* 25.—['*Intelligencer.*']

[What is the Heliothis scutosa of British authors? and who named the Rev. Mr. Green's capture? The celebrated specimen called Heliothis scutosa, belonging to the late Mr. Heysham, of Carlisle, and lately sold with the collection of that gentleman at Mr. J. C. Stevens', for 28*s*., had no resemblance whatever to the Heliothis scutosa of continental authors. Would it not be well for Mr. Green to submit his supposed H. scutosa to Mr. Doubleday's scrutiny? No one will question that gentleman's decision. But when the genus and species of a moth really unknown to us as British are thus given by a gentleman whose very name we have not the privilege of knowing, I feel that it is allowable to entertain some fears of a mistake. — *Edward Newman.*]

Description of the Larva of Eupithecia pimpinellata. — I am inclined to suspect that this insect has been wrongly named. I have constantly and most closely examined both flowers and seeds of Pimpinella magna and P. Saxifraga, but could never detect the slightest trace of the larva. I have repeatedly beaten it from the flowers of the golden rod (*Solidago Virgaurea*), and from that plant alone, though both species of Pimpinella are common in the locality. The larva is fulvous, with a series of black dorsal triangular spots, becoming confluent towards the head, and faint or altogether evanescent on the caudal segment. On either side a row of conspicuous, slanting, whitish or yellowish stripes, forming a sort of margin to the dorsal spots. Belly dusky, reddish in the centre, and having a dusky central line running the whole length. Body studded with various-sized white tubercles, and thinly clothed with short hairs. Feeds upon the flowers of Solidago Virgaurea, in August and September. I have found it by no means rare in the Kentish woods, where the underwood is from one to two years' growth, and the golden rod has room to grow and flower freely. In confinement the larva will feed freely upon Senecio Jacobæa and S. palustris. The pupa, which is enclosed in a slightly-spun earthen cocoon, is very distinct from all the rest of the family. The thorax is yellowish green, with a very accurately and distinctly-defined border, and looks almost as if set in a frame. When examined with a glass some singular dark spots and markings are seen, which give it very much the appearance of a skull. The abdomen is yellowish red, with two indistinct interrupted dorsal, and two more distinct subdorsal, dusky lines. Wing-cases yellowish olive, streaked with dusky markings, and having the nervures very prominent. The perfect insect appears in May and the beginning of June. The larva is rather slender, and tapers towards the head; in general appearance it resembles E. castigiata and E. vulgata. —*H. Harpur Crewe; Fernhill, near Oswestry, August* 8, 1859.

Description of the Larva of Eupithecia vulgata.—Common as this insect is everywhere, the larva seems to be but little known. I have never myself beaten it, but have several times reared it from the egg. It so closely resembles that of E. castigiata that it requires a very practised eye to distinguish it. It is slender, and tapers towards the head. Its general colour is reddish brown or dusky olive; along the centre of the back a chain of dirty, greenish, lozenge-shaped spots, becoming confluent at the capital and anal segments. Spiracular line waved, yellowish, occasionally interrupted with black. Segmental divisions orange. The whole body studded with minute white tubercles, and sparingly clothed with short whitish hairs. Feeds on whitethorn; full-fed the middle of July. The pupa is enclosed in an earthen cocoon; it is slender and delicate. Head, thorax, and wing-cases olive. Abdomen reddish, sharply pointed.—*Id.*

Note on the Larva of Eupithecia assimilata.—The Rev. H. H. Crewe proposes (Zool. 6579) to give us an accurate description of some one species of Eupithecia larva each month, as he may be able, and commences with E. assimilata. Few people could be found better pleased than I was when I read his proposal, and few more disappointed when I read his professed accurate description of the larva of the above insect. In some running notes on the genus Eupithecia, in the 'Intelligencer,' I gave a rough description of this species, which all who run might read. This description is so much at variance with Mr. Crewe's "accurate" description that one of us must be wrong. Mr. Crewe tells us that the larva of E. assimilata is three-quarters of an inch in length. I gave no size; but perhaps Mr. Crewe will excuse me if I now say that a full-fed larva of this species will almost measure twice the size he gives; hence he has evidently been describing poor, half-grown, sickly larvæ. The time he gives, "October 13—15," would also mislead any one who wished to breed fine specimens; for though no one will doubt that he took his larvæ at that date, still I hope those who wish to breed this species will give themselves a full month's margin, else they will not breed any males worth setting. Some of Mr. Crewe's remarks are right, and others wrong; the first and last are certainly correct. When he speaks of a dorsal line, no one would suspect that he was describing the lozenge- or diamond-shaped markings which are so conspicuous an object in one or two groups of this genus, and particularly so in E. assimilata. Perhaps I ought to apologize to Mr. Crewe for venturing to dispute his accuracy; but as I have made the genus Eupithecia my especial study for many years, I think he will excuse me, particularly as my only object is to ensure accuracy for the future. On the 29th of March, 1856, I exhibited this genus, re-arranged according to my ideas, at the Northern Entomological Society; and at the following June meeting I read a paper on the food of the larvæ of the genus. At the following meeting I exhibited about fifteen species of this genus in the larva state, alive. Thus Mr. Crewe will see that I know a little about the genus Eupithecia, and this may perhaps incline him to excuse my seeming presumption. In conclusion, I hope that more than one of the promised descriptions will be given each month.—*C. S. Gregson; Stanley, Liverpool, June* 26, 1859.

Larvæ, or Descriptions of Larvæ, earnestly desired.—As I am now engaged in describing the British moths and their caterpillars for the monthly numbers of 'Young England,' I consider it most desirable to make the descriptions directly from specimens, without any reference whatever to prior descriptions. The rich collection of moths in the cabinet of the Entomological Club affords me the means of describing with the most painstaking accuracy all the perfect insects; and the equally rich collection in the British Museum, always accessible for such an object, is the source to which my friend Mr. Willis has gone for his admirable figures of each species. But it is not equally easy to obtain the characters of larvæ. Those published in this country, I regret to say, are often most inaccurate, a fact arising from their being copied (avowedly) from continental writers, and these continental writers not having sufficiently respected the law of priority: thus we find that the names employed by Guenée and Doubleday, and now universally adopted in this country, continually differ from those of Duponchel, Hübner, Freyer, &c.; and the descriptions, however accurate as applied by these authors, become useless if transferred to other species now bearing the very same names. Under these circumstances the readers of the 'Zoologist' cannot render a greater service to entomological science than by sending me minute descriptions of all the larvæ that fall in their way; or, should they consider this too troublesome, I shall be obliged for the larvæ themselves, from which to make my own descriptions. As a guide to what are more immediately wanted, I may state that the September number will contain the genera Trichiura, Pœcilocampa, Eriogaster and Bombyx; the October number, Odonestis, Lasiocampa, Endromis and Saturnia; the November number commences the Geometræ. I wish most distinctly to state that I have no interest whatever in the sale of 'Young England;' but I do most sincerely desire to make my contributions to it as accurate as possible, with the sole view of conferring real utility on a work that has already attained a circulation which I believe to be fully tenfold that of any entomological writings ever before printed. I shall, with scrupulous exactness, give every contributor either of larvæ or descriptions full credit for his assistance.—*Edward Newman.*

Notes on Wasps.—I was much pleased with Dr. Ormerod's paper (Zool. 6641). It is there shown that wasps (or even hornets) are not the very irascible insects most people suppose. Apart from their nests and young they never act offensively; and I have noticed, many years ago, that when wasps are in a predatory mood they are always great cowards, and never attack any one. The whole of the Hymenoptera with stings are the same. Walk into a field of Dutch clover (*Trifolium repens*), with fully-developed blossoms, where tens of thousands of bees of all sorts are congregated: they make a great buzz, and appear angry at being disturbed at their pasture; but not one will ever attack an intruder. But to return to wasps, I do not remember a season in Gloucestershire with so few wasps as up to this day (August 3); the queens were numerous about the end of April and beginning of May, and I killed a great many; perhaps the cold easterly winds destroyed most of them. Last year they were so numerous as to be troublesome, but plums and wall fruit were in abundance: this year pears, plums and peaches, the principal food of wasps, are few and far between; and the same cold winds and ungenial weather seem to have destroyed both the wasps and their food. I am of opinion that the three most common British wasps begin with a single queen.—*H. W. Newman; Cheltenham, August* 3, 1859.

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To Correspondents.—Several communications are unavoidably postponed.

Occurrrence of Syrrhaptes paradoxus in Wales. — A fine male specimen of this rare bird was shot in a turnip field at Portreuddyn Farm, near Tremadoc, on the 9th of July last. It was observed together, with two other birds of the same kind, by a farm labourer in the employ of Thomas Chaffers, Esq., of 14, Great Howard Street, Liverpool, while "scuffling" the turnips. Fortunately, he was provided with a gun for shooting rooks; but, it being single-barrelled, he was unable to kill more than one bird. This was kindly forwarded to this Museum, while still in the flesh, as a donation, by Mr. Chaffers; it was shot in the head, and only one or two feathers were displaced from the crown; it has been very successfully stuffed by Mr. Butterworth, of this town, and is now open to the inspection of visitors. The two birds that escaped flew off in an easterly direction towards Merionethshire; and Mr. Chaffers has been unable to obtain any information of their having been observed either before or since. This species, which is rare in Museums, inhabits the plains of Tartary; and its occurrence in Britain is an event the importance of which is greatly enhanced by the fact of its claim to be an European species having previously been doubtful. It is included in the European list by Prince Bonaparte in his 'Geographical and Comparative List of the Birds of Europe and North America,' but is omitted by Gould, Temminck, Schlegel and Degland. I have been informed by Mr. Sclater that he has examined a specimen of the above species shot lately in Norfolk, and that he has heard also of another. These and the birds observed in Wales doubtless originally belonged to the same flock. What special influence has this year caused them to wander so far from their native land? — *Thomas John Moore; Free Public and Derby Museum, Liverpool.*

A new British Noctua: Leucania putrescens. — Early in July I took, flying over bramble blossoms, three Noctuæ which nobody here could make out. I sent one of them to Mr. Henry Doubleday, who writes that "it is certainly new to Britain, and extremely near to Leucania punctosa and L. putrescens." — *R. M. Stewart; 3, Park Place, Torquay.* [A specimen of this insect has been forworded to me, to be named, by Dr. Battersby, of Torquay; it was taken at dusk, in the middle of July, hovering over the blossom of the blackberry, on the cliffs. I presume this is the insect taken by Mr. Stewart, and this is undoubtedly L. putrescens. L. punctosa is a redder insect, with a less distinctly marked black streak from the base of the wing. L. putrescens is a native of the South and West of France. Herrich-Schäffer and Guenée both place it next to L. obsoleta.—*Ed. 'Intelligencer.'*]

[*The above articles will appear in their proper place next month.*]

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